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ALASKAN AIR COMMAND
ARCTIC AEROMEDICAL LABORATORY
FORT WAINWRIGHT

(6) T-33 AIRCRAFT SURVIVAL CONTAINER

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T-33 AIRCRAFT SURVIVAL CONTAINER

Paul W. Barnett
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Results of experimentation in this laboratory have repeatedly emphasized the importance of providing personnel subject to a survival situation with adequate clothing and sleeping gear. Although personnel are dressed adequately for the sub-zero weather, space limitations in the T-33 and B-57 aircraft make it nearly impossible for aircrew to be afforded proper protection against cold in a survival situation. Aircrews within this command are continuously faced with the possibility of survival without benefit of adequate sleeping gear. Due to the danger involved with night activity in unfamiliar surroundings and the long duration of arctic darkness, a great portion of an aircrew's time during a survival situation will be spent inactive. Analysis of Army and Air Force arctic exercises has shown that severe cold injury can be experienced during periods of inactivity with little or no subjective warning. Therefore, it is imperative that aircrews be provided with proper sleeping gear.

This study was done to determine the feasibility of placing an MC-1 sleeping bag in the T-33 aircraft.

METHODS

Measurements of the T-33 seat, located in the aircraft, with the automatic seat-style parachute and the MB-1 survival cushion were taken to determine the amount of space which could be utilized in the design of a sleeping bag container. A list of specifications was drafted. These are as follows:

- 1) Maximum allowable height above the parachute at the point pressure (three inches).
- 2) Must conform to the average buttocks for displacement of the point of pressure.
- 3) Must contain 450 cubic inches (size of pressed sleeping bag).
- 4) Must be compatible with the MB-1 survival cushion.
- 5) Must support excessive "G" loadings.
- 6) Must be well clear of the aircraft control stick.
- 7) Must not hamper ejection procedures.
- 8) Must fall free of seat, must contain no appendages which could hang on the ejected seat.
- 9) Must be safe during a parachute landing fall.

A series of containers was designed and fabricated. These models were placed in the aircraft for fit tests to use in designing a final prototype model. (See Figures 1 thru 5.)

RESULTS AND DISCUSSION

The first design was a cloth tube (Figure 1) which encompassed the MB-1 survival cushion. The tube contained the MC-1 sleeping bag packed under pressure. This container lacked the required rigidity and tended to form a cylinder. This bulge caused it to hang on the seat. Ejection and seat separation were difficult. Aircraft control stick movements were hampered by a bulge in front of the container.

A second container (Figure 2) was constructed of plywood. This container wasted much of the space available aft of the MB-1 cushion and was inadequate as a seat rest.

The difficulty of packing a sleeping bag in a configuration which would accommodate the MB-1 survival cushion was of such magnitude as to discourage the use of the cushion. It was decided to make a container to replace the cushion and include space for a sleeping bag. This container would have to contain 900 cubic inches and be compatible with the H2 oxygen cylinder. With the exception of these differences, it would still have to conform to the specifications as previously mentioned.

A model was made of wire and papier-mâché (Figure 3). This model appeared to be adequate with slight modifications and was used as a form for a Fiberglass container (Figure 4). This container was used to demonstrate the amount of packing space. After refinements of this container for aircraft control, stick clearance, and parachute release, a final model was made of wood. This wooden model (Figure 5) conformed to the following list of specifications:

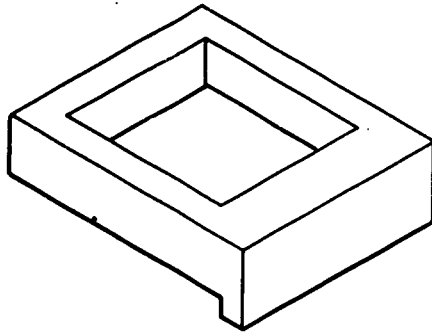
- 1) The maximum height above the parachute at the point of pressure is three inches.
- 2) It utilizes all the available space.
- 3) It contains 500 cubic inches in which to pressure-pack the MC-1 sleeping bag, with a remaining 450 cubic inches for the H2 oxygen cylinder and the survival equipment seen in Figure 6.
- 4) The pressure-packed sleeping bag gives support for excessive "G" loads.
- 5) It conforms to the buttocks, giving a displacement of the pressure and thereby reducing flight fatigue.
- 6) It is clear of the aircraft control stick.
- 7) It does not hamper ejection procedures or seat separation.
- 8) It is safe for a parachute landing fall.

CONCLUSIONS

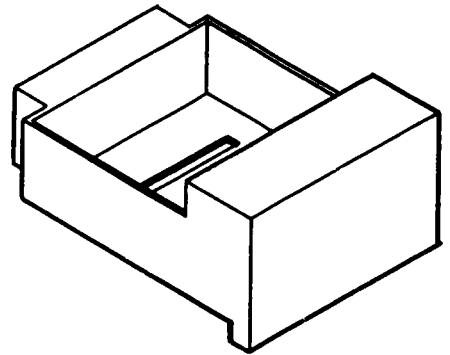
Using the container described in this report, it is possible to provide crews of T-33 aircraft the necessary protection of sleeping gear and survival equipment.

RECOMMENDATIONS

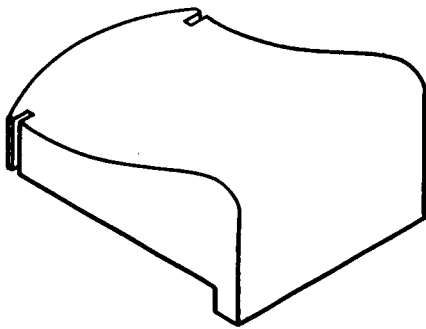
We recommend this container be produced and utilized within this command.



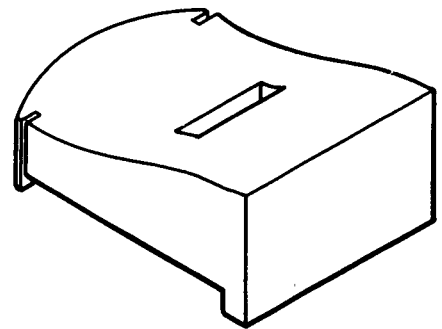
— FIGURE 1 —



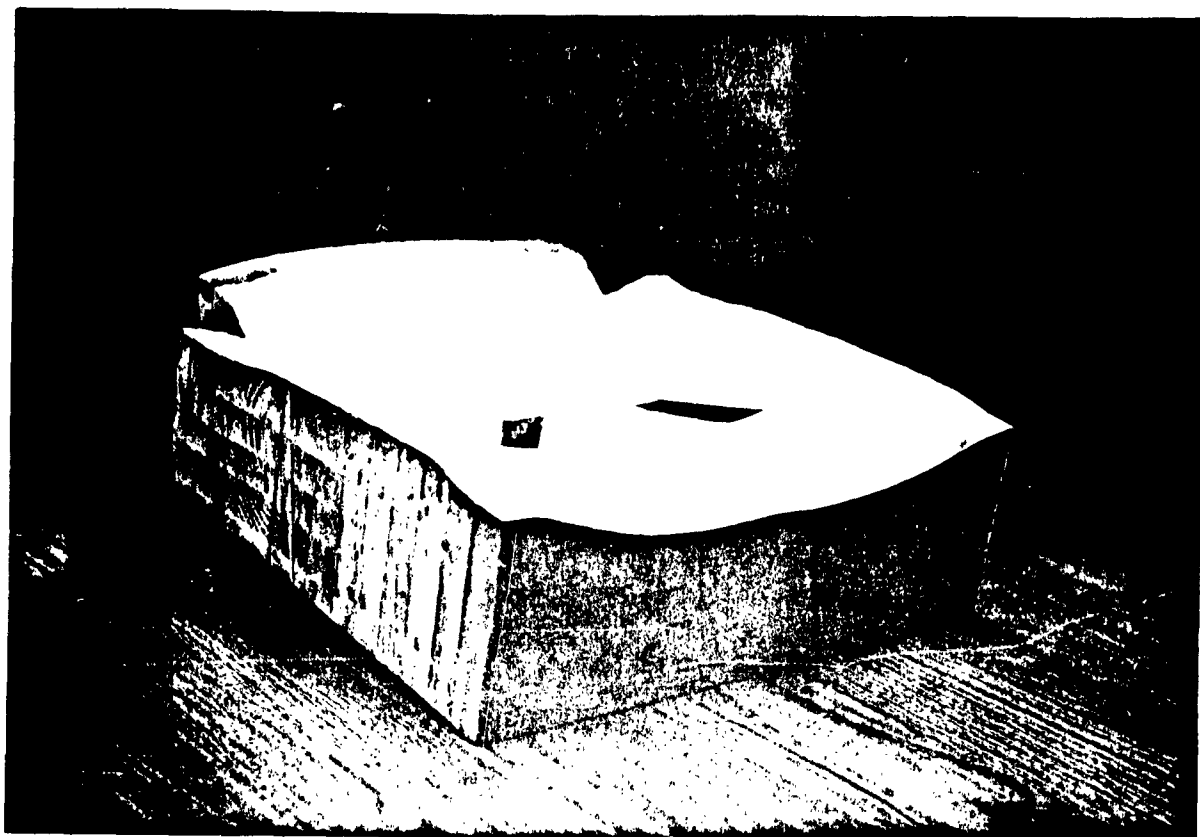
— FIGURE 2 —



— FIGURE 3 —



— FIGURE 4 —



— FIGURE 5 —



— FIGURE 6 —

- | | |
|-----------------------------------|--|
| 1. 1 signal mirror | 13. 1 vaseline gauze roll |
| 2. 1 day-night flare | 14. 1 gauze roll |
| 3. 2 matchboxes with matches | 15. Band Aids - 6-12 |
| 4. 1 pr wool ski socks | 16. 1 doz APC |
| 5. 1 pr mittens with wool inserts | 17. 1 doz water purification tablets |
| 6. 1 all-purpose knife | 18. 1 pr snow goggles (winter) or
insect repellent (summer) |
| 7. 1 - 6" file | 19. 2 parts ration survival, individual |
| 8. 1 fishing kit | 20. saw handle with detachable blade |
| 9. 20' snare wire | 21. 1 tubule of boric acid |
| 10. 1 class "B" candle | |
| 11. 1 survival manual | |
| 12. 1 plastic waterbag | |